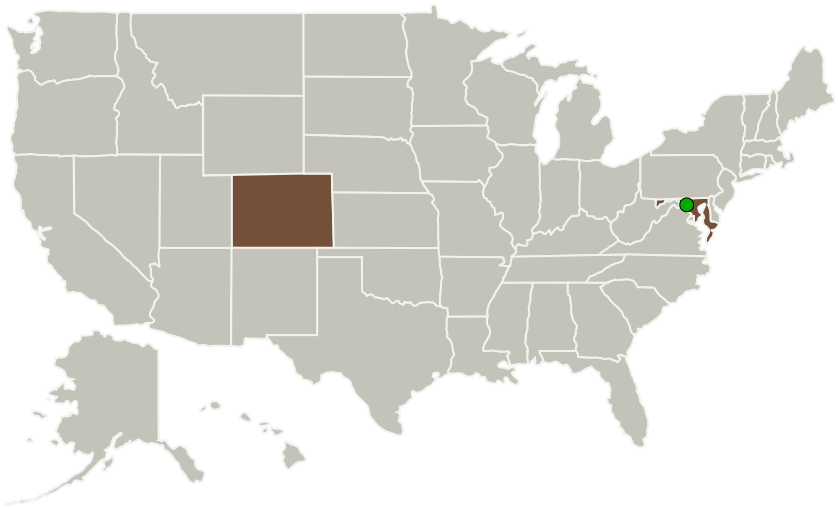
Deployable Microwave Antennas for CubeSats, NanoSats, and SmallSats, Phase I

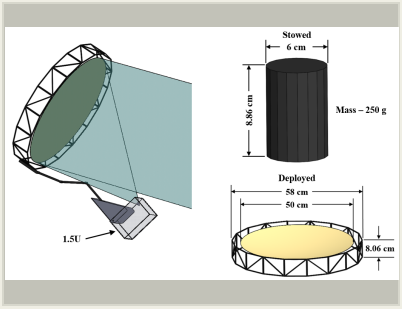
Completed Technology Project (2017 - 2017)

Project Introduction

A small deployable antenna is proposed with an offset-fed paraboloidal reflector for use between 8 and 100 GHz in CubeSat, NanoSat, and SmallSat applications. Apertures vary from 0.5 to 2 meters. For a 0.5 m aperture, the approximate dimensions of the stowed reflector are 6 cm in diameter and 8.86 cm in length, with an approximate mass of 0.25 kg. For a 1.2 m aperture, the approximate dimensions of the stowed reflector are 14.4 cm in diameter and 21.26 cm in length, with an approximate mass of 0.6 kg. For a 2 m aperture, the approximate dimensions of the stowed reflector are 24 cm in diameter and 35.4 cm in length, with an approximate mass of 1 kg. This antenna design builds off the proven mission success of similar designs while remaining competitive in performance with smaller deployable antennas. The stowed volume of this antenna is comparable to the volume of the KaDPA antenna developed by JPL, while providing a potential increase in the antenna efficiency due to the advantages of an offset-fed design compared to its center-fed counterpart. During Phase I, a preliminary design of this antenna system will be developed, as well as its deployment and testing procedures will proposed.

Primary U.S. Work Locations and Key Partners





Deployable microwave antennas for CubeSats, NanoSats, and SmallSats, Phase I Briefing Chart Image

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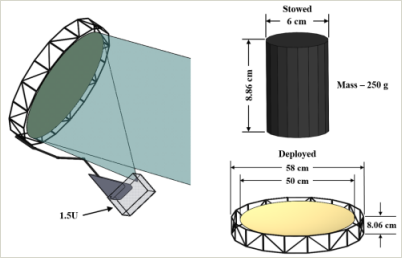
Organizations Performing Work	Role	Type	Location
Boulder Environmental Sciences and Technology	Lead Organization	Industry	Boulder, Colorado
Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations	
Colorado	Maryland

Images



Briefing Chart Image
Deployable microwave antennas for CubeSats, NanoSats, and SmallSats, Phase I Briefing Chart Image
(https://techport.nasa.gov/image/131201)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Boulder Environmental Sciences and Technology

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

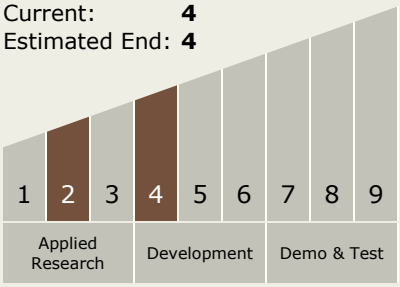
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Tristen Hohman

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



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Completed Technology Project (2017 - 2017)

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.4 Microwave, Millimeter-, and Submillimeter-Waves